

Appl. No. : 09/883,851
Filed : June 18, 2001

REMARKS

The following remarks are responsive to the May 28, 2004 Office Action. Claims 1-17 remain as originally filed and Claims 18-25 were previously cancelled without prejudice. Thus, Claims 1-17 are presented for further consideration. Please reconsider the claims in view of the following remarks.

Comments on Examiner's Statement Regarding Claims 1-17 in Light of Sawa

In the May 28, 2004 Office Action, the Examiner states that "with regard to the outstanding art rejection of Sawa the elected embodiment of figure 18 and the claims define over the prior art (Sawa)." Applicant thanks the Examiner for acknowledging the patentability of Claims 1-17 over Sawa and respectfully requests the Examiner to reconsider the allowability of Claims 1-17 in view of the following remarks.

Response to Objection to Claims 1-17 for Obviousness-Type Double Patenting

In the May 28, 2004 Office Action, the Examiner objects to Claims 1-17 as not being patentably distinct from Claims 1, 7, and 9-18 of co-pending U.S. Application No. 09/788,736 under the judicially-created doctrine of obviousness-type double patenting.

While Applicant continues to traverse this objection (as originally set forth in Applicant's "Amendment and Response to May 28, 2003 Office Action"), Applicant has enclosed herewith a Terminal Disclaimer in compliance with 37 C.F.R. § 1.321(c) to overcome this objection. Applicant respectfully requests the Examiner to withdraw this objection and to pass Claims 1-17 to allowance.

Response to Objection to the Specification Under 35 U.S.C. § 112, First Paragraph

In the May 28, 2004 Office Action, the Examiner objects to the specification "as failing to provide an adequate written description of the invention and as failing to adequately teach how to make and/or use the invention, i.e. failing to provide an enabling disclosure." The Examiner states that Applicant "has not progressed his system beyond the point of an unproven theory or concept which still requires an undue amount of experimentation to enable the artisan to make and use the inventive system for its intended purpose."

In making the objection to the present specification, the Examiner states that the specification fails to provide (1) "adequate description [or] enabling disclosure of the parameters of a specific operative embodiment of the invention," (2) an "indication of how and in what manner image magnification is realized" (e.g., by failing to provide "minimum and maximum

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values necessary to achieve the desired image magnification”); and (3) mention of an apparent role of the material being analyzed in the desired image magnification.

As discussed below, Applicant submits that the present specification satisfies the written description requirement and the enablement requirement of 35 U.S.C. § 112, first paragraph by disclosing the system recited by Claims 1-17 in such a manner that one skilled in the art will be able to practice it without an undue amount of experimentation.

1. Specification describes a specific operative embodiment

The Examiner states that “there is no evidence to indicate that [A]pplicant has succeeded in arriving at an operative system that produces improved image magnification.” While “[c]ompliance with the enablement requirement of 35 U.S.C. § 112, first paragraph does not turn on whether an example is disclosed” (M.P.E.P. § 2164.02, Rev. 2, May 2004), Applicant submits that the present specification does disclose a specific operative example of the system recited by the present claims. In particular, the present specification (see, e.g., Figure 18 and page 23, line 26 – page 25, line 22) teaches “a system for non-invasive stoichiometric detection and imaging of chemical elements and compounds in a material to be analyzed” as recited by Claims 1-4 and “a system for detecting and imaging a chemical substance” as recited by Claims 5-17.

For example, Applicant directs the Examiner’s attention to Figure 18 and page 25, lines 1-22 of the present specification, which describes the following (emphasis added):

Figure 18 shows an embodiment for stoichiometric detection inside of a diamond sample 800 by fast neutron activation. A deuterium beam 810, D^+ , from ion source 820, is accelerated and is incident onto tritiated target 830. Alpha particles 840 are emitted upwards to alpha window 850, where they are detected by an array of detectors 860. Fast neutrons are produced at the target 830 and emitted downwards towards the object 800 investigated – a diamond (black circle) at a distance L_2 . Gamma rays 870 produced by the neutrons in the diamond 800 are detected by a High Purity High Resolution Germanium Crystal Detector 880. In Figure 18, the object diamond 800 is drawn outside target box 835 for clarity; in practice, it is placed inside the target box 835 in which case $L_2=0.3$ cm. Detector distance is $L_1=115$ cm and the image ratio is $i = 115 \text{ cm} / 0.3 \text{ cm} = 380$. Hence, the image of object will be magnified 380 times at the alpha window position. Each linear dimension of the object, x_2 or y_2 , at distance L_2 will be magnified by the factor 380, thus the image dimension will be $x = ix_2$ and $y=iy_2$.

The magnification i can be augmented by a straightforward mechanical increase of L_1 to 1000X. An additional increase of i is achievable by magnetically lengthening alpha particle orbits in a magnetic field produced by a solenoid, the axis of which is at about 80 deg to the vertical axes in Figure 18.

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The above passage describes one exemplary embodiment in which a target-to-sample distance of 0.3 cm and a detector-to-target distance of 115 cm yields a magnification of 380X. The above passage further discloses that additional magnification is achieved by increasing the detector-to-target distance, either by mechanical or magnetic means. This passage, along with other portions of the present specification, discloses to persons skilled in the art how to make and use the system recited by Claims 1-17 without undue experimentation in accordance with the requirements of 35 U.S.C. § 112, first paragraph.

2. Specification describes how and in what manner image magnification is realized

The Examiner states that “there is no indication of how and in what manner said image magnification is realized.” Applicant submits that the present specification does disclose such information and Applicant directs the Examiner’s attention to the present specification at page 24, lines 28-30, which describes the following (emphasis added):

Referring to Figure 18, magnification is accomplished by making the detector arm L_1 longer than the object arm L_2 so that the imaging factor, $i=L_1/L_2$ becomes larger than unity. With $i>1$, the image will be magnified by the same ratio.

This passage, along with the rest of the present specification, discloses that the magnification is a geometric effect. An analogy can be made to the operation of a pinhole camera, in which the ratio of the image size to the object size (i.e., the magnification) is given by the ratio of the aperture-to-image distance to the aperture-to-object distance. Thus, the present specification discloses how and in what manner the image magnification is realized.

Pursuant to M.P.E.P. § 2164.01, Rev. 2, May 2004, “[t]he test of enablement is not whether any experimentation is necessary, but whether, if experimentation is necessary, it is undue.” The quantity of experimentation is not undue “if the skilled artisan is given sufficient direction or guidance.” M.P.E.P. § 2164.06, Rev. 2, May 2004. The present specification provides the interrelation between the imaging factor and the detector and object arm lengths (i.e., $i=L_1/L_2$). The present specification thus provides persons skilled in the art with sufficient information to make and use the system recited by Claims 1-17 without undue experimentation.

Contrary to the Examiner’s implication in the May 28, 2004 Office Action, Applicant is not required to provide minimum values or maximum values of the detector arm length L_1 or the object arm length L_2 to achieve a specific desired image magnification. The present specification discloses the interrelation between the imaging factor and the arm lengths. This interrelation is

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sufficient to teach persons skilled in the art how to achieve a specific desired image magnification.

Regarding the Examiner's hypothetical configuration, the Examiner states that hypothetically setting the detector arm length L_1 to infinity would appear to provide the maximum image magnification but would yield no counts. Applicant respectfully submits that the Examiner's proposed hypothetical configuration is unphysical and is not relevant to the sufficiency of the specification under 35 U.S.C. § 112, first paragraph. Setting the detector arm length L_1 to infinity is not necessary to achieve magnification and one of ordinary skill in the art would not consider setting the detector arm length L_1 to infinity.

3. Material being analyzed is not relevant to the desired image magnification.

In the May 28, 2004 Office Action, the Examiner states that "it would appear that the material analyzed also plays a key role in the desired image magnification" and that "[n]o such mention of which is present in the original disclosure." Applicant respectfully submits that the material being analyzed does not have a role and is not relevant to the desired image magnification. As described above, the present specification discloses that the first and second subatomic particles (e.g., neutrons and alpha particles) are generated at the target position, which is a first distance from the material to be analyzed, and that the magnification is a geometric effect.

Pursuant to M.P.E.P. § 2164.04, Rev. 2, May 2004, in order to make an enablement rejection, the Examiner has the initial burden to establish a reasonable basis to question the enablement provided for the claimed invention. A specification which teaches how to make and use the claimed invention must be taken as being in compliance with the enablement requirement of 35 U.S.C. § 112, first paragraph, unless there is a reason to doubt the objective truth of the statements contained therein which must be relied on for enabling support. The minimal requirement pursuant to M.P.E.P. § 2164.04 is for the Examiner to give reasons for the uncertainty of the enablement, and "specific technical reasons are always required." M.P.E.P. § 2164.04, Rev. 2, May 2004.

The Examiner has not stated a reasonable basis to question the enablement of the present specification. In particular, the Examiner has not stated any specific technical reasons for his assertion that the "material analyzed also plays a key role in the desired image magnification."

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Therefore, Applicant respectfully submits that the Examiner has failed to provide a *prima facie* case of lack of enablement in accordance with M.P.E.P. § 2164.04.

Response to Rejection of Claims 1-17 Under 35 U.S.C. § 112, First Paragraph

In the May 28, 2004 Office Action, the Examiner rejects Claims 1-17 under 35 U.S.C. § 112, first paragraph "as containing subject matter which was not described in the specification in such a way as to enable one skilled in the art ... to make and/or use the invention."

As discussed above in relation to the objection to the specification, Applicant submits that the specification teaches how to make and use the system recited by Claims 1-17 in accordance with the enablement requirement of 35 U.S.C. § 112, first paragraph. Thus, Applicant respectfully requests that the Examiner withdraw the rejection of Claims 1-17 and pass these claims to allowance.

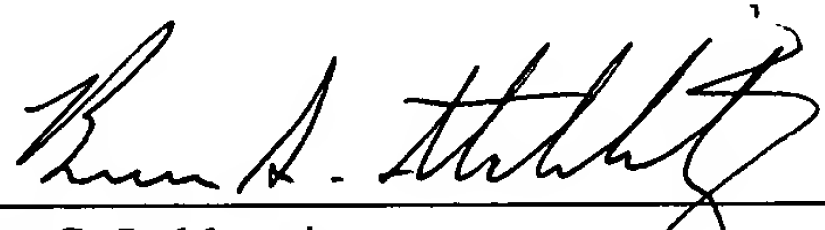
Summary

For the foregoing reasons, Applicant submits that Claims 1-17 are in condition for allowance, and Applicant respectfully requests such action.

Please charge any additional fees, including any fees for additional extension of time, or credit overpayment to Deposit Account No. 11-1410.

Respectfully submitted,

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